General characteristics and requirements of reptiles and amphibians

This topic looks at identifying the characteristics of reptiles and amphibians.

Reptiles

There are four main groups of reptiles. The first three have representatives present in Australia and the fourth only exists in New Zealand, where it is on the endangered list.

- The Crocodilians: crocodiles and alligators
- The Testudines: turtles and tortoises
- The Squamata: lizards and snakes
- The Rhynchocephalia: the tuatara.

<table>
<thead>
<tr>
<th>The Crocodilians</th>
<th>This group is made up of the crocodiles, alligators, gavials and caimans. There are 21 species of crocodile in the world and we have two here in Australia. These are the freshwater (Johnsons River) crocodile and the estuarine (saltwater) crocodile. Crocodiles are usually only kept in captivity in the Northern Territory and Queensland for farming purposes for meat and hides.</th>
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<tr>
<td>The Testudines</td>
<td>These are the turtles, tortoises and terrapins. These terms are often confused: turtles are the marine species, terrapins are freshwater turtles and tortoises live on dry land. In Australia we have turtles only and, of these, there are six species of sea turtles (Cheloniidae) and 17 species of river turtles or terrapins (Chelidae). The most commonly kept species in Australia are the common long necked terrapin and a species of snapping terrapin.</td>
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<td>Sea turtles</td>
<td>These are confined to tropical and warm temperate seas and breeding only occurs in the tropics. Sea turtles have to come out on land to lay their eggs but, once hatched, only the females ever return to land, the males...</td>
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spending their entire life in the sea.
Sea turtles have strong, paddle-like limbs.
The shell is bony and well developed.

**Freshwater turtles**

In Australia these are called 'tortoises' but they are different from the terrestrial tortoises that never spend time in water. Another name is terrapin.

They have four or five toes and claws on their webbed feet.

They live mainly in water but come out on land to dry and bask and can be found walking long distances from pond to pond in dry times.

**The Squamata**

Examples include snakes and lizards.

This is the largest group in Australia and is further subdivided into different types of lizards and snakes.

The 5 main families of lizards are:
- geckos (91 species)
- legless lizards (>30 species)
- dragons (63 species)
- skinks (>283 species)
- goannas (25 species).

The five main families of snakes are:
- elapids—the front fanged, venomous land snakes (80 species)
- colubrids—rear fanged, land snakes (10 species)
- pythons (15 species)
- sea snakes
- worm snakes (30 species).

The most commonly kept species in Australia are the children's python and water python, Slatey grey snake and the common tree snake.

**The Rhynchocephalia: The tuatara**

They are found on approximately 30 islands around New Zealand, having become extinct from the mainland last century. Total estimated numbers are 50 000-60 000. However, only seven of the remaining populations are considered healthy. The others are at risk because of small population size and/or presence of the Polynesian rat—which is thought to eat eggs and juveniles as well as competing for food—and reducing amount of ground vegetation and seedlings.

Tuataras are reptiles but they are very different from lizards, crocodiles and amphibians, such as frogs, salamanders.

Tuatara have a primitive body structure that supports the theory
that they are one of the oldest and most un-evolved species, having hardly changed in the past 220 million years which makes them even older than the dinosaurs.

They are the sole survivor of the beak-heads, which is a group of very ancient reptiles.

Tuatara can live up to 100 years.

They have a variable body temperature which enables them to survive in cold climates. They live in burrows and are nocturnal, hunting at night just outside their burrow entrance.

Young tuatara have a third eye. It is on top of the brain between its other eyes. It becomes covered over when the tuatara is an adult.

Identifying snakes

Study this table to identify the different snakes:

| Lapids (elapidae) | • These are the venomous snakes and they have fangs which are at the front of the mouth, thus making it easier to strike and envenomate their prey. The fangs have grooves along their length down which the venom travels from the gland to the prey.  
• They have 15 to 23 scales around the middle of the body and no loreal scales. These scales are used as part of the identification key.  
• Examples are the death adder, taipan, red-bellied black snake, copperhead, king brown etc. |
| Colubrids (colubridae) | • These snakes have solid teeth and are non-venomous, or they have fangs at the rear of their mouth and are only slightly venomous.  
• They have one or two loreal scales—these are the scales between the nasal scale and the scale in front of the eye.  
• They have between 13 and 23 scales around the middle of the body.  
• Examples are the green and brown tree snakes which are long, thin, very active snakes.  
• These snakes lay eggs. |
| Pythons (boidae) | • Pythons are thought of as 'primitive snakes' which indicates that these snakes were some of the first to evolve. Primitive snakes display features that link them to lizards. These features include a rudimentary pelvic girdle in the form of cloacal spurs, and lungs of equal sizes. Advanced snakes have only one functional lung and no cloacal spurs. Pythons range in size from very big (over six metres) to small (children's pythons do not get much bigger than 0.5 metres). No matter what the size, they are all constrictors.  
• Most pythons are nocturnal hunters and some species |
| **Sea snakes (hydrophiidae)** | • These snakes are adapted to an aquatic life by having valvular nostrils and a tail like a paddle.  
• They are mostly found in the northern Australian waters.  
• The best known example is the yellow-bellied sea snake. |
| **Blind or Worm snakes (Typhlopidae)** | • These snakes are small, with worm-like shiny bodies with a small, blunt head and a short tail terminating in a point.  
• Their eyes are reduced to dark spots on the head.  
• The scales are uniform in size all around the body.  
• They have a small mouth and a protruding snout.  
• Most examples are called blind or worm snakes! |

Visit the Reptile Awareness Displays of Australia website ([http://www.radoa.com](http://www.radoa.com)). This group was originally formed to combat a general misunderstanding of reptiles in the community.

Inland taipan snake  
Children's python
Learning topic: Provide advice on animal breeds and species

**Links to some snake and reptiles websites**

<table>
<thead>
<tr>
<th>Website Description</th>
<th>Website Link</th>
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<tbody>
<tr>
<td>This page was written from information provided by Dr Struan K Sutherland and from published papers.</td>
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<tr>
<td>In Australia there are about 3,000 snake bites per year, of which 200 to 500 receive antivenom; on average, one or two will prove fatal. About half the deaths are caused by bites from the brown snake, the rest are mainly inflicted by the tiger snake, taipan and death adder. Some deaths are sudden. However, it is, in fact, uncommon to die within four hours of a snake bite.</td>
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<tr>
<td>The World of Reptiles</td>
<td><a href="http://www.thesnake.org/">http://www.thesnake.org/</a></td>
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</table>
General appearance and behaviour of reptiles

It will take some practise and plenty of observation to be able to tell what a healthy reptile and amphibian should look and act like. Because they are ectothermic, their behaviour will vary according to environmental temperatures. This means on a cool day or first thing in the morning after a cool night, they will appear sluggish and less responsive. Some may be more aggressive as they try to compensate for their inability to move fast.

Reptiles do not have skin or fur to inspect so we must go by the condition of their scales, which should have a healthy sheen. However, if they are about to shed, the scales will lack lustre and may even be peeling off. The reptile usually stops eating so it is important to know this and not try to force feed the animal during a shed. Some reptiles lose their skin in a single shed whereas others will lose it in pieces. It is important to know which way your reptile should shed; for example, a snake usually loses its skin as a whole piece and will tend to shed in bits if there are injuries or scar tissue that prevent the skin coming off as a whole, or if the humidity in its environment is incorrect.

They should be alert and responsive if at their preferred body temperature. Some will become immobile at the threat of danger hoping that their camouflage will protect them—eg chameleon—where others, such as snakes, will attempt to leave if the danger is too close.

Tortoises and turtles are usually alert, swim on an even keel and can move quickly when approached. When handled, they will retract their head, legs and tail into their shell and these can be very difficult to extract! When they walk they lift their bodies and support all their weight on their legs and not on the plastron, the underneath of the shell.

Behaviour in relation to body temperature regulation

Reptiles and amphibians are ectothermic, meaning they rely primarily on environmental sources for their body heat. However, they do use behaviour to help stop their body temperatures directly following that of the environment. For example, on very hot days they will seek shade and water to keep cool rather than overheat. On cool days they will seek out warm sunny spots, lower their body closer to a warm stone and/or align their bodies along the sun rays as they bask to raise their body temperature. Some species will even change to a darker colour to absorb more heat.

An example of body heat conservation behaviour is seen in the banded knobtail gecko from Western Australia. This gecko, when exposed on very cold ground with surface temperatures less than eight degrees Celsius, scrapes a depression and then scoops loose soil onto its back with its front legs. This is thought to help them conserve their body heat, as well as acting as camouflage.
As it gets colder reptile amphibian metabolic rates will slow down until they eventually have to hibernate until the warmer weather returns. Reptiles in cold conditions will be sluggish and slow to respond.

**Aestivation**

This is an instinctive retreat from hot, dry conditions. It is common in the wild for many ground frogs and tortoises to dig themselves into the bottom of a river or dried up creek until conditions are right again. Most Australian amphibians do this in summer and during drought conditions.

**Territorial behaviour**

Most reptiles are territorial, often having a burrow to which they retreat. Most reptiles and amphibians are shy, preferring to hide from humans and other large animals.

**Photoperiod**

- This is important for snakes, and captive snakes should be provided with as close as possible to normal photoperiod. Constant light is very stressful so light bulbs used for heat should be coloured, either red or blue.

- Sunlight or UV light must be supplied as it is used in the manufacture of vitamin D which is very important for the uptake of calcium from the diet. Glass filters out UV so just having a glass fronted cage in a sunny room is not enough.

- Reptiles normally kept indoors when placed in direct sunlight will become aggressive and active. Rain can also produce a sudden burst of activity.

**Amphibian behaviour**

The skin of amphibians is not waterproof, which means they can lose a lot of body water on warm days. For this reason, frogs are most active at night
when they will hop about in search of food or a mate. During the day, they find a hiding spot and wait until the heat and light of the sun has passed.

Most people only realise that frogs are about when they hear frogs calling near a pond or stream.

Keeping frogs

All frogs and tadpoles are protected in NSW. Never take frogs from the wild, or damage their ponds or habitat. Some frogs and tadpoles, which are available from societies such as the Frog and Tadpole Study Group, can be kept as pets. These have either been bred in captivity or cannot be released back into the wild.

Frogs are sensitive creatures and are easily killed, sometimes merely by picking them up. To successfully keep frogs you need to know how to look after them. They need live food, and will not readily eat dead or non-moving food items. Frogs need clean water and an environment with shelter and feeding space.

Tadpoles are a little easier to keep. They need clean water—tap water needs to be treated to remove chlorine compounds to make it safe for tadpoles—and a diet of suitable plant food. Their pond needs rocks to climb onto when they metamorphose and areas in which to escape from the sun.